

**PASTORIA ENERGY FACILITY (99-AFC-7C)**  
**Petition for Conversion from Aqueous to Anhydrous Ammonia**  
**Facility Design Staff Analysis**  
**Prepared by Shahab Khoshmashrab**

**PROPOSED MODIFICATION**

On June 28, 2001, the California Energy Commission received an amendment to the Application for Certification (99-AFC-7C) from Calpine for the Pastoria Energy Facility. This post-certification amendment proposes to replace the previously licensed aqueous ammonia with anhydrous ammonia for use in the NO<sub>x</sub> reduction process.

**LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

If the above-proposed modification to this project is approved, no changes to the applicable engineering LORS will result and the project will remain in compliance with all the applicable engineering LORS.

**ANALYSIS**

The analysis associated with the original application has not changed as a result of the above-proposed modification except that the aqueous ammonia storage tank will be replaced with the anhydrous ammonia storage tank in the list of major structures and equipment, Table 1. This table was included in Condition of Certification GEN-4 instead of GEN-2 in the Commission Decision. Staff believes that this error was not intentional and does not effect the staff analysis.

The proposed change in this amendment does not necessitate additional analysis or re-analysis of the project from an engineering perspective.

**CONCLUSIONS AND RECOMMENDATIONS**

The requested modifications in this amendment will not result in impacts on facility design. Staff recommends approval of this request and proposes the following change to Condition of Certification **GEN-4**, Table 1, Major Equipment List.

**CHANGES TO EXISTING CONDITIONS OF CERTIFICATION**

Added text is underlined, deleted text is shown as ~~strikethrough~~.

(Facility Design, GEN-4)

Table 1: Major Equipment List

Equipment/System	Quantity Plant	Size/ Capacity*	Remarks
Combustion Turbine (CT) Generator	3	168 MW each	Dry Low NO <sub>x</sub> combustion control
Steam Turbine (ST)	2	185/90 MW	Single shaft HPT, IPT and LPT (2x1 configuration and 1x1 configuration)
Generators	5		Included with CT and ST
CT Inlet Air Filter	3	3,600,000 lb/hr	
Inlet Air Cooling	3		Evaporative/Refrigeration/Fogging
Fuel Gas Filter – Separator	3	150,000 lb/hr	
Turbo expander	1	230,000 lb/hr	
Heat Recovery Steam Generator (HRSG)	3	550,000 lb/hr	HP, IP, LP with reheat
HRSG Stack	3		18'-0" dia.x213' high
Catalytica CO Emission Control	3		Achieve BACT/LAER
Catalytica NO <sub>x</sub> Emission Control	3		Achieve BACT/LAER
Ammonia Injection Skid	3		Two blowers per HRSG-alternate
Aqueous Anhydrous Ammonia Storage Tank	3	12,000 gal	Double walled tanks – alternate, for NO <sub>x</sub> control
HP/IP HRSG feed-water pumps	6	1,700 gpm	HP with interstage bleed
Make-up Water Clarifier	1	5,6000 gpm	Gravity flow
Make-up Water Storage Tank	1	2,300,000 gal	Includes firewater storage
Demineralized Water Pumps	3	170 gpm	
Demineralized Water Treatment Package	1	350 gpm	
Demineralized Water Storage Tank	1	150,000 gal	
Condensate Pumps	5	1300 gpm	1 spare per condenser
Circulating Water Pumps	6	60,000 gpm/ 30,000 gpm	2x1 Configuration/1x1 Configuration
Wet Cooling Tower Banks	2	1.100mm BTU/hr / 600 mm BTU/hr	2x1 Configuration/1x1 Configuration
Fire Water Pump Skid	1	3,000 gpm	
Auxiliary Cooling Water Pumps	3	750 gpm	
Plant Air Compressors & Dryers	2	750 cfm	
Step-up Transformers	4	18/20 kV	To electrical grid
Emergency Backup Standby Generator	1	66 kW	Natural Gas Fired

\*All capacities and sizes are approximate and may change during project final design.

**REFERENCE**

Pastoria Energy Facility, LLC. 2001a. Amendment to Application for Certification for the Pastoria Energy Facility (99-AFC-7C). Submitted to the California Energy Commission, June 28, 2001.